UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

From: Chris Rhyne and Nancy Hunt

To: Stephen Heare, Acting Director
Permits and State Programs Division

Subject: Report on Johns Hopkins Medical Center Visit

On Jan 15, 1998 members of the mixed waste team (Hunt, Bell, Joglekar, Ordaz, and Rhyne) visited the Johns Hopkins University/Hospital campus to meet with radiation safety personnel and tour their mixed waste storage facilities. The hospital and university are separate facilities and have separate identification numbers for RCRA. The State of Maryland is not an authorized state for the Mixed Waste program but is a Nuclear Regulatory Commission (NRC) agreement state. Johns Hopkins is a Class A licensee and is currently in the process of license renewal. A timely renewal application has been made.

We arrived at 2024 E. Monument, the radiation safety offices shortly after 10:00 a.m. and met with the radiation safety officer for the entire complex, Stanley Wadsworth, and the technical services manager, Carl Granlund. Mr. Wadsworth and Mr. Granlund were briefed on the nature of the proposed mixed waste rule initiative and the purpose of our visit (to observe a hospital/university NRC regulated waste storage area). Messrs. Wadsworth and Granlund then proceeded to describe campus' storage areas, and the nature of the radioactive wastes that were generated by the hospital and university. Mr. Wadsworth showed us the facility's quarterly inventory sheets that list the radionuclides and their activity for each numbered drum of waste stored on site. There appears to be four major radionuclide waste streams generated: laboratory debris (paper products, rags, gloves, masks, plastic, glassware, etc.), irradiated animal carcasses, bulk water-based liquids, and scintillation vials. Some of these wastes, such as the scintillation vials, may be considered hazardous in a mixed waste authorized state. Maryland is not yet authorized for mixed waste, but state RCRA regulations apply. Radioactive wastes, such as scintillation vials, are also governed by NRC.

Mr. Wadsworth indicated that more than 90% of the radionuclides were short-lived, mainly beta emitters. That is, they had half-lives of less than 90 days (e.g., I-195 and P-32). In order to assure that all short-lived radio nuclides are eliminated, wastes are stored on site for 10

half-lives (three years) before being treated on site by incineration (The incinerator has a permit from the State of Maryland). The exceptions to the three-year storage rule include animal carcasses, which are incinerated immediately, and scintillation vials, which are sent to the PermaFix mixed waste treatment facility in Gainesville, Florida. Liquids are treated with an organic powder to form a gel for ease of handling. After decay the gel mixture is incinerated as either a solid or hazardous waste. Incinerator ash is sent to the Barnwell, South Carolina NRC licensed disposal facility. The incinerator ash is collected by a waste disposal broker twice a year. Waste minimization practices have apparently reduced waste production by half, from 12 drums per year to six drums per year.

Wastes with long half-lives (primarily tritium and carbon-14) are stored for three years in order to remove any short-lived radionuclides (e.g., I-195) that may inadvertently be present. On-site incineration is then possible; however, to maintain good public relations, at the end of three years these long-lived wastes are sent to SEG for compaction and then on to Barnwell for final disposal. Long-term liability concerns prevent them from using Envirocare for final disposal of longer half-lived radioactive wastes.

We later went to the hospital complex and visited two, out of a total of five, facility storage areas. The first storage area, located in the main hospital, was collocated with what appeared to be part of the hospital's ventilation plant. The entire room was secured by a locked door and the drum storage area was surrounded by a locked chain linked fence marked with radiation warning signs. Drums in the storage area were stacked two high, were generally polyurethane (although several steel drums were noted), and were usually placed on wooden pallets. There was no sign of leaking drums or any other moisture.

The nominal drum capacity was 35 gallons. Each drum was labeled "radioactive" and was also labeled with a general description of the contents and the applicable radionuclides. When sealed, the drums were also dated so that they could be removed for further processing at the end of three years. This area appeared to meet basic RCRA drum storage area standards. The second storage area we visited was in the medical research building (also the location of the waste incinerator). Although this drum storage area was not fenced, it was within a locked room and was dedicated to waste. As in the first room, there was no evidence of leaking or damaged drums. Aside from some waste cardboard, the area was dry, clean, and neat.

The storage areas each had a compactor for volume reduction and monitoring equipment which provided a continual check that ambient radiation levels were below levels that would result in exposures of greater than 100 millirem per year. We were told workers in storage areas were not required to be badged.

After a final brief discussion, and after receiving a sample of the gel powder used to solidify liquids, we returned to Crystal Station.